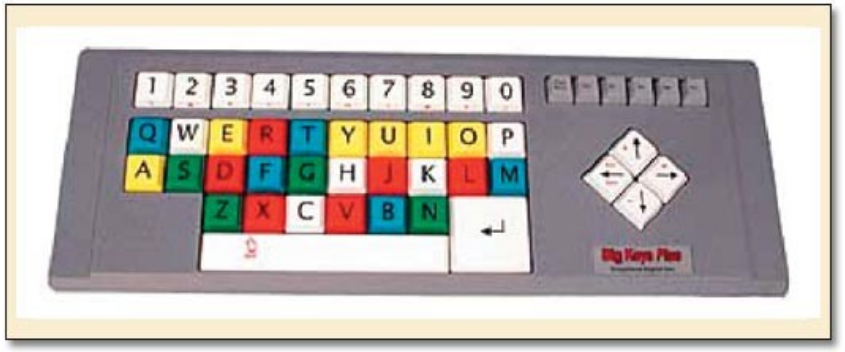
Devices for Accessibility & Data Processing

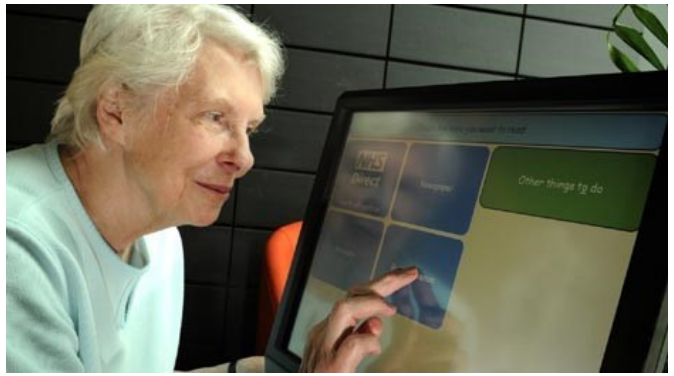
HARDWARE DEVICES/COMPONENTS

Accessibility Devices

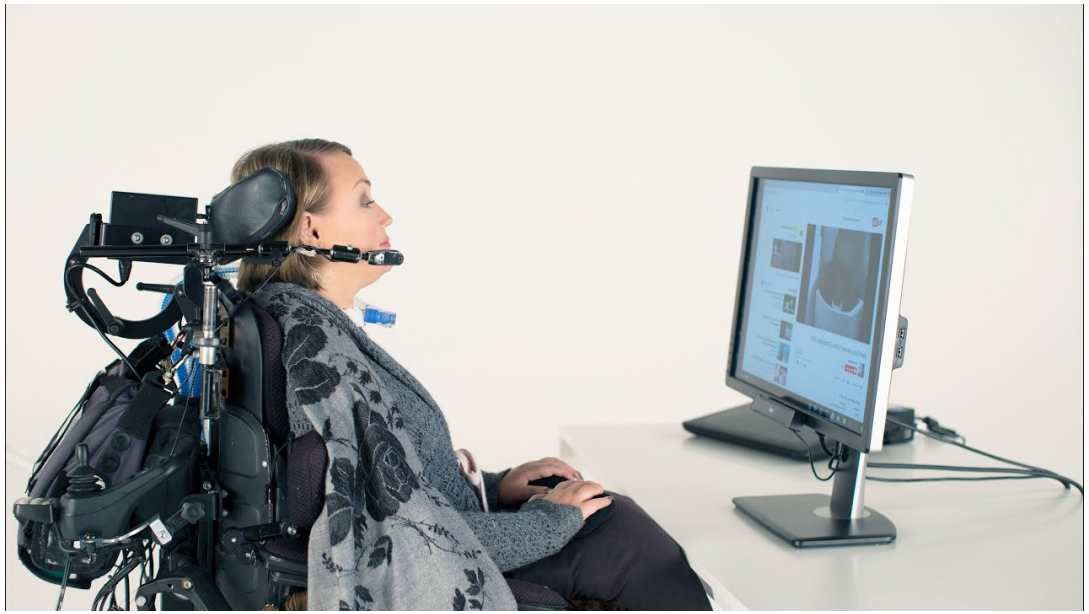
Peripheral Devices specifically created to allow accessibility for people with difficulties

Trackball





Touch screen or Large Keypad



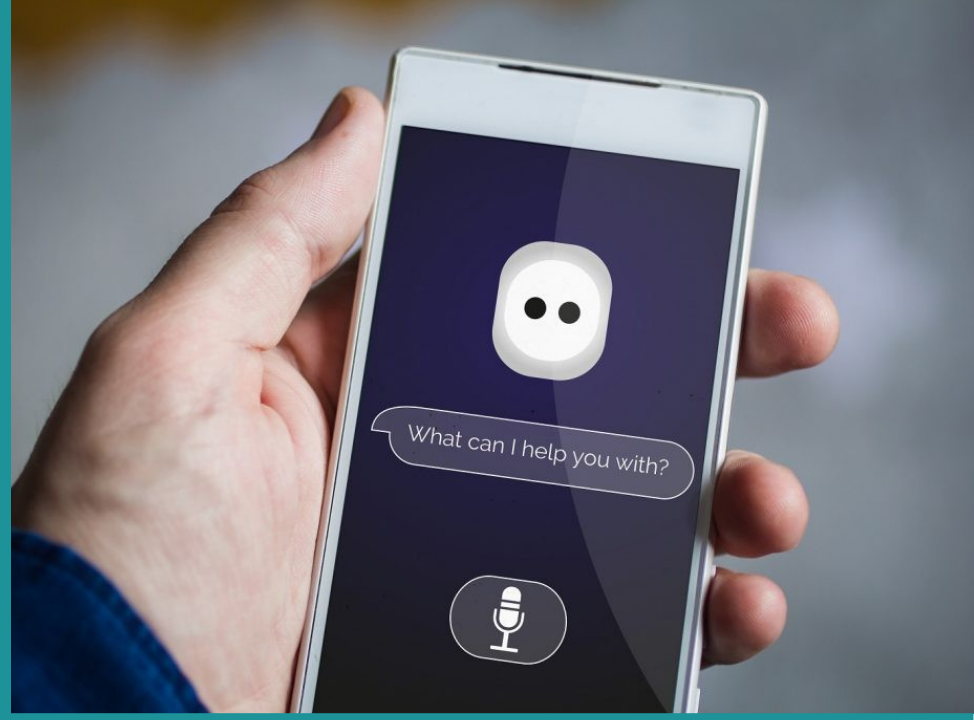
Eye Motion Sensors & Head motion Trackers

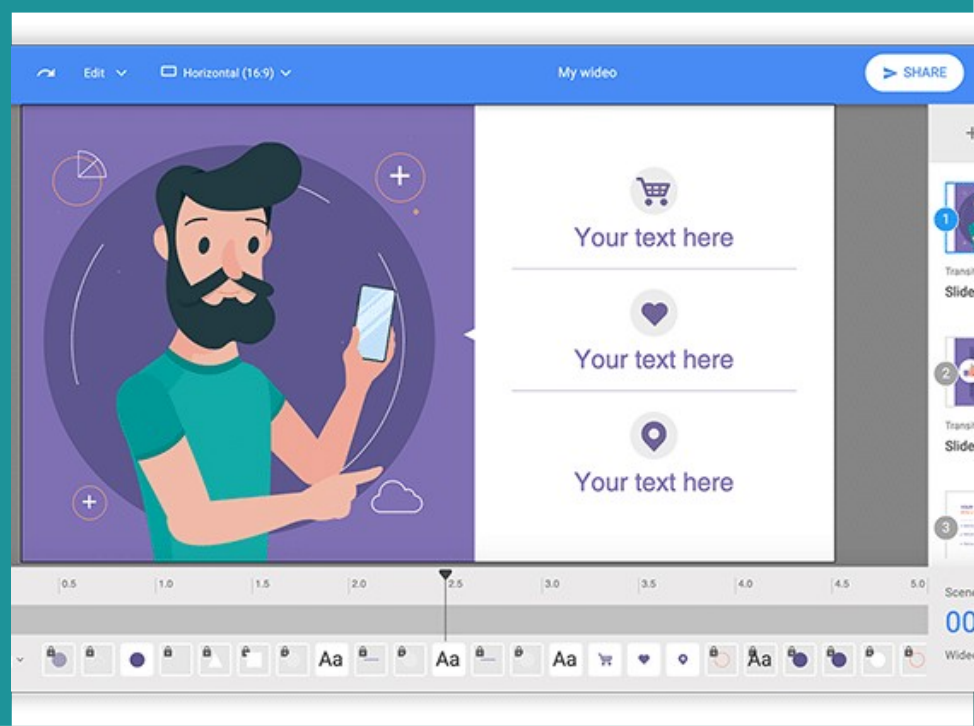
Braille Embosser

Adaptive Technologies

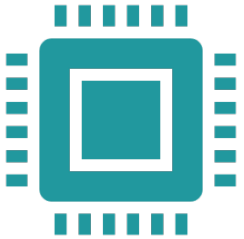
Designed Specifically to aid people with disabilities

Both hardware and software





Manual and automatic data processing



Peripheral Devices that can automate in and processing of data

Avoids human error and typos during data entry

01

Keying client product details into a database

02

Entering customers meal choices into a restaurant’s system

03

Marking exam scripts

04

Entering survey responses from a form

Manual Processes

Automatic Processes/Devices

- Biometric Readers
- Barcode/2D Readers
- OMR
- Radio-frequency Identification device
- Smart Meters

Accessibility Devices

Computers are used by everyone. However many people, such as those with physical disabilities, require an alternative method of input and output in order to access a computer system and the services they provide.

These specialist input and output devices are referred to as accessibility devices, or often as adaptive technology, or assistive technology.

Accessibility Devices

Braille Embossers – This is a printer that will output using braille cells as opposed to standard ink text. This allows people with visual impairments to access the hard copies of their work after printing.

Screen Magnifiers – This usually attaches to an existing monitor and magnifies the display output to make it easier to see. This is useful for users with a visual impairment.

Eye Typers – This uses a camera mounted on the computer that tracks the user's eye movement to detect where they are looking in order to enter data with an onscreen keyboard. Clicks can be recorded by blinking slowly. This is used by people with such significant mobility difficulties that they cannot use a keyboard/mouse/trackball.

Accessibility Devices

- **Trackballs** – This acts as an alternative to a mouse. This device is made up of a ball that sits within a holder that can be rotated in order to move the cursor on the screen. This can be easier to use for people with limited mobility.
- **Braille & Large Key Keyboards** – Braille keyboards use braille characters on each key of the keyboard. Large key keyboards are keyboards with larger sized keys for typing. They often also include high contrast colouring on the keys. Both of these devices improve accessibility for users with a visual impairment.
- **Touchscreens** – While not strictly an accessibility device, touchscreens are often easier for selecting items on screen than using a mouse for users with limited mobility. As you can resize and change the colouring of onscreen elements (such as an onscreen keyboard) this can also help users with visual impairments to access a computer.

Manual data processing

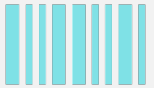
Involves an individual entering data into the computer themselves, usually by typing on a keyboard, though it could be by clicking on objects with a mouse, using a touchscreen or giving voice commands.

Automatic Data Processing

Automatic data processing helps resolves these problems as the role of data entry is taken away from individual users. Instead, specialist devices will interpret data, converting from its physical source into digital data stored on the computer.

Examples

Optical mark readers that are used to enter data from pre-printed forms. This is used commonly for lottery tickets but also used to be popular with school registers.



Barcode readers for inputting product details automatically by scanning the barcode on the back of the device and matching it with a database.

Smart readers in homes to monitor electricity and gas usage and automatically send this data to the energy supplier for accurate billing.

Radio Frequency Identification (RFID) chips used for monitoring stock and even automatic collection of stock using robotics.

Comparing Manual & Automatic Data Processing

Manual	Automatic
Human Error – People are prone to making mistakes, such as typos, which causes incorrect results after the data is processed. Poorly designed forms can make this even worse.	Accuracy – Data accuracy is usually much greater as entry won't be subject to human error. This is not true if OCR is involved though, which can be affected by poor handwriting.
Time-Consuming – It takes time for individuals to enter data manually into a computer system and perform processing. Double entry is also required to ensure data integrity which takes even longer.	Time & Cost – Data entry can be completed much more quickly as forms can be read through at fast rates and without breaks. This also saves cost on hiring data entry staff.
Complex Data – Data can be complex and so automated data entry methods may not exist that can handle the data. Manual entry can handle any data type.	Inflexible – Only very specific data ranges can be inputted usually, so it cannot handle more complex data. OCR can handle more complex data but not with good accuracy.
Reduced Training – Staff are very likely to be familiar with manual data entry methods. This means that staff will not require training to be able to input data.	Learning Curve -New automatic data entry processes usually require data entry staff to receive training. This is both expensive, & time-consuming.

- Manual data processing involves an individual entering data into the computer themselves.
- For example, this could be a hotel entering customer booking details or a teacher marking examination papers or coursework.
- Automatic data processing is where the role of data entry is taken away from individual users.
- For example, this could be OMR used for lottery tickets or smart readers in homes to monitor energy use.
- Manual data entry is good at handling complex data and requires less training. However automatic data entry is more accurate, quicker and cheaper.
- Accessibility devices are used to aid people with disabilities in accessing the information on computer systems.
- Examples include trackballs, braille keyboards, large key keyboards, touchscreens, braille embossers, screen magnifiers and eye typers.

Lesson Summary